

REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application in light of the claim changes above and the remarks that follow. Claims 1, 3-25, 27-29, 31-33, 35, 36, 38-61, 64-68 & 70-75 are pending, of which claims 12-24, 47-59 & 72 are withdrawn from consideration, and claims 7, 8, 11, 27, 31, 35, 42, 43, 46, 64, 65 & 70 have been indicated as allowable. Applicant notes with appreciation the Examiner's indication of allowable subject matter and issuance of a new, non-final Office Action.

By this Amendment, claims 1, 33, 36 & 68 have been changed. Support for the changes to claims 1, 33, 36 & 68 may be found in the specification at, for example, page 8, lines 1-18, page 13, line 32 to page 14, line 26; and FIG. 2:24

Rejection of Claims 36, 38-46, 60-61, 64-68 & 70 Under Section 101

Applicant traverses the rejection of claims 36, 38-46, 60-61, 64-68 & 70 under Section 101. The Examiner alleges that these method-type claims fail to satisfy the requirements of Section 101 because they are not tied to a statutory device, system or apparatus. (Office Action, p. 2.) Applicant disagrees.

Claim 36 recites, *inter alia*, "A method of enhancing the quality of a reproduced image *comprised of a plurality of pixels* having original *pixel* values corresponding to the image." (Emphasis added.) The plain meaning of "pixel" is "the basic unit of the composition of an image on a television screen, computer monitor, or similar display." (*The American Heritage® Dictionary of the English Language, Fourth Edition*, retrieved January 22, 2009, from Answers.com Web site: <http://www.answers.com/topic/pixel>, emphasis added.) Since television screens, computer monitors, and displays are statutory devices, the claimed "method of enhancing the quality of a reproduced image comprised of a plurality of pixels" is tied to a statutory device. (Emphasis added.) Accordingly, claim 36 satisfies the requirements of Section 101. Applicant, therefore, requests that the rejection of claim 36 under Section 101 be withdrawn.

Claims 60, 61 & 68 recite subject matter similar to that recited in claim 36. Accordingly, claims 60, 61 & 68 recite statutory subject matter under Section 101 for the same reasons given above for claim 36.

Claims 38-46, 64-67 & 70 depend from claims 36, 60, 61 and 68. As such, these claims also recite statutory subject matter at least due to their corresponding dependence from claim 36, 60, 61 and 68.

Rejection of Amended Claims Under Section 103(a)

As noted above, independent claims 1, 33, 36 & 68 have been amended. Claim 1 recites, *inter alia*, “an adjusted pixel value calculation unit which compares the interpolated pixel value with an original input pixel value and adjusts the interpolated pixel value by designating one of the original input pixel value or the interpolated pixel as an output pixel value based on the comparison result.” (Emphasis added.) Applicant respectfully submits that the documents applied in the Office Action do not disclose or suggest at least this feature of claim 1. Claims 33, 36 & 68 include a similar feature.

Because none of the applied references disclose or suggest the above-noted feature, these references cannot support a rejection of claims 1, 33, 36 & 68 under Section 103 for at least this reason. Claims 3-6, 9, 10, 38-41 & 43-45 are also allowable at least due to their corresponding dependence from claims 1 & 36.

To the extent the rejections of 1, 3-6, 9, 10, 33, 36, 38-41, 43-45 & 68 in the Office Action might be considered to still apply, these rejections are traversed for the reasons detailed below.

Rejection of Claims 1, 3-6, 25, 29, 36, 38-41, 60-61, 71 & 73-74 Under Section 103(a)

Applicant traverses the rejection of claim 1 under Section 103(a) as allegedly not being patentable over U.S. Patent 5,019,903 to *Dougall et al.* ("*Dougall*") in view of U.S. Patent 6,219,464 to *Greggain et al.* ("*Greggain*") and U.S. Patent No. 5,475,438 to *Bretl*.

The Office Action's Piecemeal Treatment of the Claim
Features Cannot Support a *Prima Facie* Case of Obviousness

At the outset, Applicant notes the Office Action rejected claim 1 by applying various combinations of *Dougall*, *Greggain* and *Bretl* against each feature individually. This is improper. "USPTO personnel may not dissect a claimed invention into discrete elements and then evaluate the elements in isolation. Instead, the claim as a whole must be considered." (M.P.E.P. 2106(II), *citing Diamond v. Diehr*, 450 U.S. 175, 188-89, 209 USPQ 1, 9 (1981).)

In the Office Action, the Examiner appears to have simply added on *Bretl* to the previous rejection that combined *Dougall* and *Greggain* without considering how or why one of ordinary skill in the art would combine all the references together. Because the Examiner has considered the claimed features individually, rather than as a whole, the Office Action does not establish a *prima facie* case for rejecting claim 1 under Section 103 for at least this reason.

The Applied Patents Fail to Teach or
Suggest All the Features Recited in Claim 1

The applied patents cannot support a rejection of claim 1 under Section 103(a) because they do not teach or suggest all the recited features. (See M.P.E.P. § 2143.) The Examiner concedes that *Greggain* does not disclose or suggest an "input pixel" having "an original pixel value." Accordingly, *Greggain* cannot disclose or suggest, "determin[ing] whether or not an edge included in an input pixel selected from the plurality of pixels belongs to a vertical area," "calculat[ing] an interpolated pixel value for the input pixel" "compar[ing] the interpolated pixel value with an original input pixel" and "adjust[ing] the interpolated pixel value by designating one of the original input pixel value or the interpolated pixel as an output pixel value based on the comparison result." (Emphasis added.) *Dougall* does not overcome these deficiencies.

Dougall discloses a system for generating progressive scan video by interpolating pixels to fill blank lines between lines of interlaced video.¹ (*Dougall*, col. 1:15-25, 48-54.)

The Examiner apparently asserts that *Dougall's* interpolated pixel position X (the Examiner's so-called “pixel to be interpolated”) corresponds to the claimed “input pixel.” (Office Action, p. 4.) Applicant disagrees.

Dougall's interpolated pixel position X is merely a location where a pixel may be displayed. However, pixel position X does not “correspond to [an] image” because there is no pixel in position X until after one is interpolated from surrounding pixels (AX, BX). In other words, the surrounding pixels (AX, BX) are inputs to an operation from which a value for an interpolated pixel in position X is the output. (See, e.g., *Dougall*, col. 4:51-68.) As such, pixel position X cannot be considered to correspond to the claimed “input pixel” having “an original pixel value.” (Emphasis added.) Accordingly, *Dougall* does not disclose or suggest the above-noted features of claim 1 missing from *Greggain*.

Bretl does not overcome *Greggain's* deficiency either. For the most part, the disclosure of *Bretl* relied-on is duplicative of that provided by *Dougall*. (See, e.g., *Bretl*, cols. 1:26-39, 2:37-43.) The Examiner cites *Bretl* for disclosing a “motion value” that can be used in interpolating pixels. (Office Action, p. 5, *citing Bretl*, col. 5:36-40.) The motion value is determined, in part, based on the difference between pixels in the same spatial position as an interpolated pixel, but one field earlier and one field later. (*Id.* at col. 5.) However, because *Bretl's* “pixels in the same special position as the interpolated pixel” are from different frames, they belong to different images.

In contrast, claim 1 recites, “enhancing the quality of a reproduced image comprised of a plurality of pixels having original pixel values corresponding to the image,” “calculat[ing] an interpolated pixel value for [an] input pixel” and “compar[ing] the interpolated pixel value

¹ In an interlaced video, each frame of video is “drawn” in two steps: (1) by first drawing all odd lines in the frame first, and (2) then drawing all even lines (e.g., lines 1-3-5 etc., then lines 2-4-6, etc.) By comparison, progressive scan video displays all lines consecutively (e.g., 1-2-3-4-5-6, etc.). To convert from interlace to progressive video, *Dougall* would, for instance, fill in line 2 by interpolation using lines 1 and 3.

with an original input pixel value and adjust[ing] the interpolated pixel value by designating one of the original input pixel value or the interpolated pixel as an output pixel value based on the comparison result based on the comparison result.” (Emphasis added.) According to claim 1, the “interpolated pixel value” is adjusted based on the “original input pixel value” of the “image.” Thus, *Bretl*’s disclosure of determining a value for an interpolated pixel from pixels of different images in different frames cannot correspond to the “input pixel” recited in claim 1. Therefore, *Bretl* also does not disclose or suggest, “determin[ing] whether or not an edge included in an input pixel selected from the plurality of pixels belongs to a vertical area,” “calculat[ing] an interpolated pixel value for the input pixel” “compar[ing] the interpolated pixel value with an original input pixel” and “adjust[ing] the interpolated pixel value by designating one of the original input pixel value or the interpolated pixel as an output pixel value based on the comparison result,” as recited in Applicant’s claim 1. (Emphasis added.)

Because *Greggain*, *Dougall* and *Bretl* do not teach or suggest the above-identified features of claim 1, the references, when taken individually or in combination cannot support a rejection of claim 1 under Section 103. Applicant, therefore, respectfully requests that the rejection of claim 1 be withdrawn and the claim allowed.

Allowability of Claims 1, 3-6, 25,
29, 36, 38-41, 60-61, 71 & 73-74

For all the reasons set forth above, the applied references cannot support a rejection of claim 1 under 35 U.S.C. § 103(a). As such, Applicant requests that the rejection of claim 1 be withdrawn and the claim allowed.

Independent claims 25, 36, 60, & 68, although of different scope than claim 1, recite subject matter similar to that recited in claim 1. Accordingly, claims 25, 36, 60 & 68 are allowable over *Greggain* for similar reasons to those set forth above with regard to claim 1.

Claims 3-6, 26, 30, 38-41 & 61-63 are allowable at least due to their corresponding dependence from claims 1, 25, 36, 60 & 68.

Rejection of Claims 10, 33, 45, 68 & 75 Under Section 103(a)

Applicant traverses the rejection of claims 10, 33, 45, 68 & 75 under 35 U.S.C. § 103(a) as allegedly not being patentable over *Dougall* and *Greggain* and in further view of U.S. Patent 6,262,773 to *Westerman*. As noted above with regard to claim 1, *Greggain* and *Dougall* fail to disclose or suggest Applicant's claimed "input pixel." For similar reasons, *Westerman* also does not disclose the claimed "input pixel" (*see, e.g., Westerman*, FIGs. 3-5). Accordingly, the applied references, when taken individually or in combination, cannot support a rejection of claim 10 under 35 U.S.C. § 103(a).

Claims 33, 45, 68 & 75 recite limitations similar to those recited in claim 10. Accordingly, the applied reference cannot support a rejection of claims 33, 45, 68 and 75 for similar reasons as those provided above with regard to claim 10.

Rejection of Claims 9, 28, 32, 44, 66 & 67 Under Section 103(a)

Applicant traverses the rejection of claims 9, 28, 32, 44, 66 & 67 under 35 U.S.C. § 103(a) as allegedly not being patentable over *Dougall* and *Greggain* and in further view of U.S. Patent Application Publication to *Yoo et al.* ("*Yoo*").

Claim 9 depends from claim 1 and, therefore, includes all the limitations of claim 1. Accordingly, *Greggain* and *Dougall* also fail to disclose or suggest the "input pixel" in claim 9. *Yoo* is relied on for purported teaching of "compar[ing] the directional differences to a threshold value (TH_VAL) and if the values are less than the threshold then the chosen leftward/rightward (positive/negative slope) directionality are considered imprecise at which point a reevaluation of the directionality is performed." (Office Action, p. 13.) However, *Yoo* does appear not to disclose the claimed "input pixel." Accordingly, when taken individually or in combination, the purported combination of *Greggain*, *Dougall* and *Yoo* cannot support a rejection of claim 9 under 35 U.S.C. § 103(a).

Claims 28, 32, 44, 66 & 67 recite limitations similar to those recited in claim 10. Accordingly, the applied reference cannot support a rejection of claims 28, 32, 44, 66 & 67 for similar reasons as those provided above with regard to claim 9.

Conclusion

For the reasons set forth above, Applicant respectfully requests allowance of the pending claims.

If additional fees are required for any reason, please charge Deposit Account No. 02-4800 the necessary amount.

Respectfully submitted,

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